Epstein Barr Virus in the Heart: A Case of Infectious Mononucleosis Causing Perimyocarditis

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Case Presentation

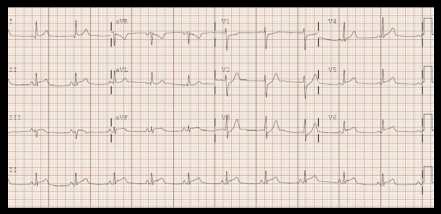
- 19 y/o male with no significant past medical history presented with ~1 week of chest pain in the setting of viral URI symptoms.
- Initial EKG revealed ST segment elevation primarily in the inferolateral leads and slight PR depression. He was started on ibuprofen and colchicine for suspected pericarditis. Troponins were elevated (988 at 0h --> 1171 at 1h, delta of 183, down-trending thereafter). TTE revealed an LVEF of 50% with borderline mild posterior and lateral wall hypokinesis. The patient was given 325 mg ASA and taken for cardiac catheterization, which did not reveal any evidence of CAD (Fig 1).
- He tested positive for EBV IgG and IgM; US demonstrated mild to moderate splenomegaly. Cardiac MRI depicted abnormal delayed contrast enhancement, edema and hypokinesia/akinesia predominantly in the lateral wall of the LV myocardium with enhancement favoring the subepicardial myocardium, consistent with viral myocarditis. LV systolic function was reduced at 42% and RVEF mildly decreased at 46% (Fig 2).
- He was seen by the Advanced Heart Failure team, who recommended starting metoprolol succinate and lisinopril, and discontinuing ibuprofen.

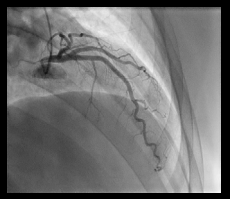
EBV – Infectious Mononucleosis

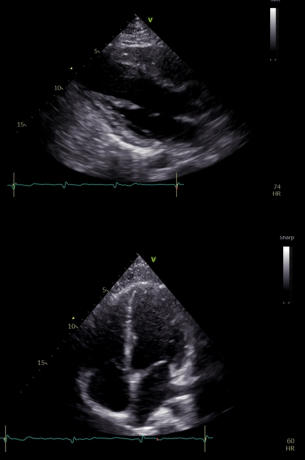
- **Virus**: Ebstein Barr virus (EBV) or human herpesvirus 4 (HHV-4): dsDNA, linear, enveloped
- **Transmission**: close contact with oropharyngeal secretions
- **Pathophysiology**: invasion of human B and T lymphocytes with latency phase
- **Diseases and Malignancy**: infectious mononucleosis (IM), B and T cell lymphomas, Hodgkin lymphoma, and nasopharyngeal carcinoma
- **Presentation**: most commonly asymptomatic but often with early headache, fatigue, and low-grade fever, followed by pharyngitis/tonsillitis, tender cervical lymphadenopathy and high-grade fever (i.e. IM). Hepatitis and splenomegaly may also occur. Most symptoms usually persist for weeks except fatigue which can persist for months. Complications can include airway obstruction due to lymphoid hypertrophy, splenic rupture, morbilliform rash, oral hairy leukoplakia (immunocompromised hosts), lymphoproliferative disorders and malignancies.
- **Diagnosis**: heterophile antibody testing or the detection of EBV-specific antibodies, EBV DNA blood or plasma levels via PCR assays. CBC often shows lymphocytosis with atypical lymphocytes (non-specific). An estimated 95% of adults are EBV antibody seropositive[1,2].
- **Management**: most cases resolve with supportive care including acetaminophen and NSAIDs. Corticosteroids have not shown clear benefit as an antiviral treatment[3,4]. Patients are advised to refrain from strenuous exercise and contact sports for ~3 weeks to minimize the risk of splenic rupture.

EKG and Cardiac Imaging

Figure 1: 12 lead EKG showing diffuse ST elevations in II, III and aVF and V4 through V6 with reciprocal depressions (top right). Coronary angiogram showing unremarkable left and right coronary arteries, respectively (bottom right).







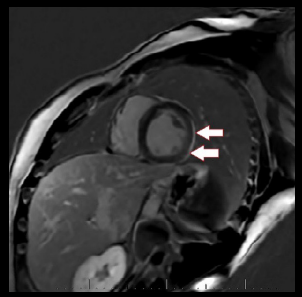


Figure 2: TTE images of parasternal long axis (left top) and apical four chamber (left bottom) views demonstrating normal chmaber size and no pericardial effusions. Cardiac MRI showing abnormal delayed contrast enhancement within the lateral left ventricular myocardium (right).

Follow Up & Conclusions

- At follow up visit in cardiology clinic 5 days post-discharge, he reported no chest pain and had discontinued use of ibuprofen accordingly. He did report fatigue and GI upset, which were attributed to lingering effects of his EBV infection and possibly colchicine use, respectively.
- Repeat TTE ~2 months post-hospital discharge revealed low-normal LVEF and no regional wall motion abnormalities. Patient was advised to discontinue lisinopril and metoprolol at this time and to continue colchicine for a total of 3 months. Repeat cardiac MRI was deferred given his reassuring clinical picture, labs and imaging.
- In cases of chest pain in a young adult accompanied by elevated troponins and ST elevation on EKG, it is important to consider viral infectious etiologies such as EBV as a cause of myopericarditis. This can sometimes result in marked changes in cardiac function, such as wall motion abnormalities and impaired systolic function.
- Management strategies include the use of colchicine and other anti-inflammatory agents along with beta blockers and ACE inhibitors to augment cardiac function and blood flow[5].

References

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